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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/590,191

08/21/2006

Shuichi Fujikawa

Q95858

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SUGHRUE MION, PLLC  
2100 PENNSYLVANIA AVENUE, N.W.  
SUITE 800  
WASHINGTON, DC 20037

EXAMINER

ZHANG, YUANDA

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/590,191	<b>Applicant(s)</b> FUJIKAWA ET AL.	
	<b>Examiner</b> YUANDA ZHANG	<b>Art Unit</b> 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 May 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 25-48 is/are pending in the application.
- 4a) Of the above claim(s) 32-48 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 25, 26 and 28-31 is/are rejected.
- 7) ☒ Claim(s) 27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08/21/06</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of group 1, Species 1 in the reply filed on 05/08/09 is acknowledged. The traversal is on the ground(s) that the restricted species are not given explanation and they are merely explanatory diagrams. This is not found persuasive because the restricted species are clearly shown in the specification that they are different configurations of a rod-type solid-state laser system which are stated in the specification as alternate embodiments with respect to each other (see Brief Description of The Drawings, PG Pub of the instant application, paragraph [0009] – [0023]). Therefore, claims 32-48 are withdrawn from examination.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 25-31 are presented for examination.

### ***Information Disclosure Statement***

3. The information disclosure statement filed 08/21/06 is being considered by the examiner.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 25, 26 and 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akiyama et al (US PG Pub 2003/0058542 A1) (Applicant Admitted Prior Art) in view of Burrows et al (US Patent 5,001,718).

7. In re claim 25, with reference to figure 1, Akiyama et al disclose a rod-type solid-state laser system (consists of a solid-state laser apparatus 1 and a light-incident optical system 22) in which, by means of a relay lens (13) and a coupling lens (14) (The Examiner notes that lenses 13 and 14 defines an optical relay since they are spaced by the sum of their focal lengths, a definition of optical relay can be found in Kuizenga US Patent 5,025,446 col. 2 lines 20-24) (paragraph [0063] lines 3-5), a laser beam emitted from a symmetric stable optical resonator (1, symmetrical around the partial reflecting output mirror 14) consisting of a rod-type solid-state laser medium (laser rods 5 & 6, paragraph [0056] lines 4-6), a partially reflecting mirror (4), and a totally reflecting mirror (3) is made to enter an optical fiber (8), the relay lens is arranged at a position (distance a from the partial reflection mirror 4, paragraph [0063] lines 1-3) at which the relay lens transfers the first reference plane onto a first image plane and transfers the second reference plane onto the coupling lens, and the coupling lens is arranged at a position

(distance  $b$  from the optical fiber 8, paragraph [0064] lines 1-3) at which the coupling lens transfers the first image plane onto the endface of the optical fiber (see figure 3).

8. Akiyama et al do not explicitly disclose a first reference plane is set at an arbitrarily position between the endface, of the rod-type solid-state laser medium arranged close to the partially reflecting mirror, that opposes the partially reflecting mirror and the middle point of the rod-type solid-state laser medium, a second reference plane is set at a position that is optically symmetric with the first reference plane, with respect to the partially reflecting mirror. (The Examiner notes that thermal lens effect inevitably occurs in an optically pumped solid-state laser due to a temperature distribution by the pump source in which the thermal lens effect functions as a lens, see Nishimae et al US Patent 7,336,690 B2, col. 1 lines 30-34).

9. However, with reference to figures 1 and 2, Burrows et al disclose a similar rod-type solid-state laser system comprising a first reference plane (thermal lens  $L_R$  on plane C on the rod solid-state medium 17 as shown in figure 2, col. 3 lines 18-22) is set at an arbitrarily position between the endface, of the rod-type solid-state laser medium arranged close to the partially reflecting mirror, that opposes the partially reflecting mirror and the middle point of the rod-type solid-state laser medium (middle point of the rod-type solid-state laser medium is interpreted to be a mid point of the two rod solid-state media 12 & 17 or a location of a partial reflecting output mirror 14, see figure 1), a second reference plane (due to thermal lens effect, similar thermal lens of  $L_R$  also occurs at the rod solid state medium 12 and can be positioned symmetrical to  $L_R$ , col. 3

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lines 5-18) is set at a position that is optically symmetric with the first reference plane, with respect to the partially reflecting mirror.

10. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the rod-type solid-state laser system of Akiyama et al with the arrangement of the relay lens system as taught by Burrows et al in order to compensate for variations in the lens effect and obtain an output beam with constant beam diameter (col. 2 lines 20-26).

11. In re claim 26, Burrows et al disclose wherein a thin-wall lens is assumed that is optically equivalent to a thermal lens ( $L_R$ ) formed at a position between the endface, of the rod-type solid-state laser medium arranged close to the partially reflecting mirror, that opposes the partially reflecting mirror and the middle point of the rod-type solid-state laser medium, and the first reference plane is set at the position of the main plane of the assumed thin-wall lens (see rejection of claim 1).

12. In re claim 28, Akiyama et al disclose wherein an aperture (aperture 23) is arranged at the position of the second reference plane (paragraph [0076] lines 1-7).

13. In re claim 29, Akiyama et al / Burrows et al have disclosed the claimed invention (Akiyama et al disclose aperture 23 controls the laser beam diameter, paragraph [0077] lines 1-3) except wherein the opening diameter of the aperture is approximately the same as the diameter of the rod-type solid-state laser medium. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the opening diameter of the aperture of Akiyama et al with approximately equal to the diameter of the rod-type solid-state laser medium, since it has been held

that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) MEPE 2144.05 (II-B)

14. In re claim 30, Akiyama et al / Burrows et al have disclosed the claimed invention except wherein the rod-type solid-state laser medium is singular. It would have been an obvious matter of design choice to have a single rod-type solid-state laser medium, since applicant has not disclosed that a single rod-type solid-state laser medium solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with multiple rod-type solid-state laser media as taught by Akiyama et al.

15. In re claim 31, Akiyama et al disclose at least one more rod-type solid-state laser media (laser rods 5 & 6, paragraph [0056] lines 4-6).

***Allowable Subject Matter***

16. Claim 27 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. The following is an examiner's statement of reasons for allowance: Burrows et al disclose a thermal lens on a plane between the endface of the rod-type solid-state laser medium arranged closed to the partially reflecting mirror opposite to the partially reflecting mirror and the middle point of the rod-type solid-state laser medium (see figures 1 and 2). However, Burrows et al do not disclose the thermal lens positioned on the endface. Therefore, claim 27 is believed to be allowable over the cited prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YUANDA ZHANG whose telephone number is (571)270-1439. The examiner can normally be reached on Monday-Friday, 9:00am-5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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/Yuanda Zhang/  
Examiner, Art Unit 2828  
08/13/09

/Minsun Harvey/  
Supervisory Patent Examiner, Art Unit 2828